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Understanding low levels of physical activity in people with intellectual disabilities: A systematic review to identify barriers and facilitators

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Abstract

Background: People with intellectual disabilities (ID) undertake extremely low levels of physical activity. *Aims:* To enhance understanding concerning low levels of physical activity in people with ID, this study has three aims: (1) to identify barriers to and facilitators of physical activity in people with ID; (2) to examine differences in barriers and facilitators between levels of ID (mild, moderate, severe, and profound); (3) to examine differences in barriers and facilitators between various stakeholder groups. *Methods and procedures:* A systematic search was performed using the following databases from the year 1990: MEDLINE, ERIC, and PsycINFO. The studies included were peer reviewed, available as full text, and written in English, addressing barriers to and facilitators of physical activity in people with ID. The quality of the studies was assessed using existing critical review forms. All studies were subjected to qualitative synthesis to identify and compare barriers and facilitators. *Outcomes and results:* In all, 24 studies were retrieved, describing 14 personal and 23 environmental barriers and/or facilitators. The quality of the studies varied, particularly for qualitative studies. Only two studies included people with severe or profound ID. Stakeholder groups tend to identify barriers outside their own responsibility. *Conclusions and implications:* Results reveal a broad range of barriers and facilitators, but not for people with more severe ID. Further research should also examine these factors among stakeholders responsible for providing support.

What this paper adds

It is generally known that people with intellectual disabilities (ID) have sedentary lifestyles and undertake low levels of physical activity. This paper presents an overview of barriers to and facilitators of physical activity, thereby enhancing understanding concerning this phenomenon. This thorough scan of the literature addresses three different perspectives, focusing on factors, level of ID, and stakeholders. In addition to providing an overview of existing knowledge needed in the development, implementation, and maintenance of initiatives aimed at increasing physical activity, this paper addresses gaps in current knowledge. Recommendations for future research are described. The results of this review could be useful to researchers and professionals in the development, implementation, and maintenance of physical activity initiatives in daily practice.

Keywords: people with intellectual disabilities, physical activity, barriers, facilitators, implementation, role of direct support professionals

1. Introduction

People with intellectual disabilities (ID) undertake extremely low levels of physical activity (Dairo, Collett, Dawes, & Oskrochi, 2016; Hsieh, Heller, Bershadsky, & Taub, 2015; Stancliffe & Anderson, 2017; Van der Putten, Bossink, Frans, Houwen, & Vlaskamp, 2017). According to one meta-analysis, higher severity of ID, living in a residential facility, and older age were related to decreased likelihood of meeting physical activity guidelines, with the strongest predictor being the level of ID (Dairo et al., 2016). A large cross-sectional study added that individuals with severe motor impairments (e.g., wheelchair-bound) were at especially high risk of being sedentary (Stancliffe & Anderson, 2017). The results of these studies were consistent with those of a cross-sectional study demonstrating an overall picture of inactivity in the daily support provided to people with a combination of profound intellectual and severe motor disabilities (Van der Putten et al., 2017).

Although it is generally acknowledged that physical activity offers benefits to people with all levels of ID (Bartlo & Klein, 2011; Jones et al., 2007), the development, implementation, and maintenance of effective approaches to achieving structural increases in the physical activity of people with ID have proven complex, particularly for those with more severe ID. To date, however, most approaches to physical activity have paid little or no attention to the unique needs of people with ID, and even less attention to the needs of those who provide support to these people in their efforts to be physically active (Bartlo & Klein, 2011). This is remarkable, as the majority of people with ID require support in many activities of daily life, including physical activities (Buntinx & Schalock, 2010). More specifically, a large share of the sub-population that has been identified as being at the greatest risk of physical inactivity – people with a combination of severe or profound intellectual and motor disabilities – is completely dependent on support in all activities of daily life (Nakken & Vlaskamp, 2007).

The development of approaches that properly address the needs of daily practice requires a better understanding of factors that impede or facilitate physical activity (or the support thereof), as perceived by all parties involved (Bartholomew, Parcel, Kok, Gottlieb, & Fernández, 2011; Fraser, Richman, Galinsky, & Day, 2009). In one review, Bodde and Seo (2009) identify social and environmental barriers to physical activity in adults with ID, including issues related to transport and finances, negative support, and lack of awareness of options. However, this review refers to people with ID in general, without distinguishing between various levels of ID (Bodde & Seo, 2009). This distinction is important, as the problem of physical inactivity is greater for people with more severe ID (Dairo et al., 2016; Stancliffe & Anderson, 2017). Different levels of ID require different efforts from support professionals. Bodde and Seo (2009) recommend further exploration of discrepancies between reports from people with ID and proxy reports, in order to improve understanding of physical inactivity in people with ID. This corresponds to the need to understand the perceptions of all stakeholders, and it is even more important for situations calling for changes in daily support that have indirect effects on people with ID, particularly those with more severe ID (Bartholomew et al., 2011).

Another shortcoming of the review by Bodde and Seo (2009), and one that is likely to be of equal importance, is that the authors did not screen any facilitators of physical activity.

Against this background, our systematic review aims to answer the following research questions:

1. Which barriers to and facilitators of physical activity participation in people with ID are mentioned in the literature?
2. Do these barriers and facilitators vary for people with mild, moderate, severe, and profound ID?
3. Do different stakeholder groups have different perceptions of barriers and facilitators?

2. Method

2.1. Literature search

In September 2015, a search was performed using the following databases from the year 1990: MEDLINE, ERIC, and PsycINFO. The keywords were ("intellectual disability" OR "learning disability" OR "mental retardation") AND ("physical activity" OR "motor activity") AND ("facilitators" OR "barriers"). Inclusion criteria were as follows: (1) full-text scientific publication in English; (2) published in a peer-reviewed journal, and (3) focused on identifying barriers and facilitators related to physical activity in people with ID. Review articles and commentaries were excluded. The search was expanded by screening the reference lists of included articles and by conducting a "cited by" search on Google Scholar.

2.2. Screening and eligibility

The first author screened the search results and eliminated duplicates and non-scientific hits. Working independently, the first two authors performed an initial selection based on title (34 titles; agreement 91%). In case of disagreement, the papers were included. The first two authors then performed a second selection based on abstract. Publications were included if there was agreement by the first two authors (26 abstracts; agreement 88%). In the case of disagreement, full-text analyses were discussed with all authors until consensus was reached. The first author screened the reference lists and conducted the "cited by" search. The search was repeated in July 2016, immediately before the final analyses, resulting in the inclusion of four additional papers.

2.4. Data extraction and quality evaluation

Data were extracted by the first author, using an extraction table identifying the authors and publication year; the aim (or aims) of the study; the population, including age range and level of ID (i.e., mild, moderate, severe, and profound); characteristics of the sample, including informant, sample size, setting and country; study design, including type of data (i.e., qualitative or quantitative); and method of data collection and data analysis. The identified results (i.e., barriers and facilitators) were also extracted. Barriers were defined as factors that limit, inhibit, or impede physical activity in people with ID, and facilitators were defined as factors that facilitate, support, encourage, or enable physical activity in people with ID (Jones, 2005). The first author assessed the quality of each included paper using critical review forms (Law et al., 1998; Letts et al., 2007). The critical review criteria were rated according to a yes/no score, with the total of yes scores indicating the quality of the study. A maximum of 14 points could be assigned to each qualitative study (Letts et al., 2007), with 13 points possible

for each quantitative study (Law et al., 1998). Data extraction and quality evaluation were discussed with the second and third authors.

2.5. Data synthesis and presentation

The quality ratings of the included studies were described according to mean (SD) and range. Data extraction was summarized (see Table 1). All manuscripts were subjected to a four-step qualitative synthesis. First, the first author merged barriers and facilitators of similar meaning (e.g., health deficiencies, health concerns, and several health problems; or staff limitations, insufficient staffing, and staffing problems). Second, all barriers and facilitators were classified as either personal or environmental, yielding a final list, with barriers and facilitators constituting opposites arranged alongside each other (see Appendix A). Third, all factors were displayed in an established framework, providing insight into factors that were reported as barriers, as facilitators, or as both barriers and facilitators. The framework consists of five categories: factors identified as barriers (full barriers); factors identified mainly as barriers, but also as facilitators (barriers); factors identified equally as barriers and facilitators (neutral); factors identified mainly as facilitators, but also as barriers (facilitators); and factors identified as facilitators (full facilitators; Van Adrichem et al., 2016). Fourth, comparative analyses were conducted to answer the second and third research questions. Level of ID was divided into the categories mild, moderate, severe, and profound. Stakeholder groups were divided into 1) individuals with ID, 2) parents, 3) direct support professionals (i.e., all staff working directly with people with ID), and 4) indirect support professionals (i.e., all staff working indirectly with people with ID, including managers and program coordinators).

3. Results

In all, 24 papers ultimately met the inclusion criteria (see Figure 1). Together, these papers describe a total of 37 factors that impede or facilitate physical activity in people with ID.

** Insert Figure 1 about here**

3.1. Study characteristics

The characteristics of the 24 studies are presented in Table 1. Sample sizes ranged from 6 (Aherne & Coughlan, 2016) to 88 (Heller, Hsieh, & Rimmer, 2003) participants (M = 28.5, SD = 18.9). In all, 684 participants were involved: 264 people with ID, 221 direct support professionals (e.g., group-home supervisors, volunteers, teachers and job supervisors), 33 indirect support professionals (e.g., service managers, program coordinators), and 166 parents. Fifteen studies included direct support professionals, with 13 including people with ID, 11 including parents, and four including indirect support professionals. Thirteen (54%) of the papers focused on people with mild to moderate ID, and two included people with severe to profound ID (Aherne & Coughlan, 2016; Hawkins & Look, 2006). In 10 of the studies, the level of ID was not reported.

Of the 24 papers, 20 (83%) were qualitative, and 4 (17%) followed a quantitative design. Data-collection methods varied for the qualitative studies. The majority used semi-structured interviews, while some used in-depth interviews or focus groups. All quantitative studies were based on data collected using questionnaires (i.e., survey checklists, email

surveys, questionnaires completed during interviews). All of the studies identified barriers to physical activity, and 18 described facilitators. Quality ratings for the qualitative studies ranged between 2 and 12 points (of a maximum of 14; *M*=8.7, *SD*=2.5). Scores for the quantitative studies ranged from 8 to 11 points (of a maximum of 13; *M*=9.3, *SD*=1.5). Three of the four quantitative studies described the use of reliable measurements to examine barriers, with two also describing the measurements as valid.

** Insert table 1 about here**

3.2. Personal barriers to and facilitators of physical activity

In all, 14 personal factors were identified (see Table 2). Full facilitators were social interaction and being rewarded for participation in physical activities. Twelve studies noted that social engagement with peers, friends, or a team encouraged physical activity in people with ID (Barr & Shields, 2011; Brooker et al., 2015; Dixon-Ibarra, Driver, Vanderbom, & Humphries, 2016; Downs et al., 2014; Downs, Boddy, Knowles, Fairclough, & Stratton, 2013; Frey, Buchanan, & Rosser Sandt, 2005; Mahy, Shields, Taylor, & Dodd, 2010; Menear, 2007; Temple & Stanish, 2011; Temple & Walkley, 2007; Tsai & Fung, 2009; van Schijndel-Speet, Evenhuis, van Wijck, van Empelen, & Echteld, 2014). In six studies (25%), being praised or rewarded was described as having a facilitating effect (Barr & Shields, 2011; Dixon-Ibarra et al., 2016; Frey et al., 2005; Mahy et al., 2010; Temple & Walkley, 2007; van Schijndel-Speet et al., 2014). Full barriers were fear and the financial resources of individuals with ID. For example, Van Schijndel-Speet and colleagues (2014) described the fear of falling during physical activities in older people with ID. Routine was reported as a barrier (Dixon-Ibarra et al., 2016; Melville et al., 2009) and a facilitator (Mahy et al., 2010; van Schijndel-Speet et al., 2014).

Most of the personal factors (*n*=9) were reported mainly as barriers. Health issues constituted the most frequently reported barrier, followed by the motivations and preferences of people with ID. Several health issues (e.g., overweight, illness, ear problems, heart conditions) were identified as impeding physical activity in people with ID (Aherne & Coughlan, 2016; Caton et al., 2012; Downs et al., 2013; Mahy et al., 2010). Conversely, physical activities were also performed to prevent or reduce health issues (Menear, 2007; Temple & Stanish, 2011; van Schijndel-Speet et al., 2014). The motivations and preferences of people with ID were also reported in different ways, although the majority of the studies reported that people with ID lacked motivation and prefer sedentary activities (Caton et al., 2012; Dixon-Ibarra et al., 2016; Temple & Walkley, 2007). Additional personal barriers included physical disabilities, physical discomfort, lower intellectual functioning, and aging. Conversely, some studies reported that physical and intellectual ability, feeling good and energetic, and younger age facilitate physical activity in people with ID (Barr & Shields, 2011; Frey et al., 2005; Tamar Heller, McCubbin, Drum, & Peterson, 2011; Sundblom, Bergström, & Ellinder, 2015). In addition, behavioral issues and the skills of individuals with ID were identified as impeding physical activity (Aherne & Coughlan, 2016; Barr & Shields, 2011; Dixon-Ibarra et al., 2016). Conversely, physical activities are also performed as a means of reducing negative behavior (Dixon-Ibarra et al., 2016), and individuals with ID who

have good social skills have more opportunities for inclusion in physical activities (Tsai & Fung, 2009).

3.3. Environmental barriers to and facilitators of physical activity

In all, 23 environmental factors were identified (see Table 3). The main full facilitator consisted of activities with an element of fun (Alesi & Pepi, 2015; Dixon-Ibarra et al., 2016; Mahy et al., 2010; Temple & Stanish, 2011). Each of the other environmental facilitators was reported in only one study: having a one-to-one nature program to meet individual needs (Aherne & Coughlan, 2016), having a pet (Dixon-Ibarra et al., 2016), and receiving support from a research team (Sundblom et al., 2015). Full barriers were a lack of financial support; limited options for physical activity; anxiety on the part of staff and parents; time constraints of parents; and competitive activities. The lack of availability of adapted, accessible activities was reported equally as a barrier and a facilitator. Staff interest in physical activity and the positive or negative support related to it were reported in almost the same number of studies, as was the regular/irregular nature of physical activity programs (Aherne & Coughlan, 2016; Caton et al., 2012; Dixon-Ibarra et al., 2016).

Most of the environmental factors were mainly reported as barriers. According to 13 studies, staffing levels limit the inclusion of physical activity in daily practice. In addition, transport difficulties were reported in nine studies. For example, Caton and colleagues (2012) report that many of their participants with ID mentioned having problems with transportation, which prevented them from accessing many physical activities. Other studies add that the need for transportation to activities was accompanied by high stress and expenses (Mahy et al., 2010; van Schijndel-Speet et al., 2014). As reported by Dixon-Ibarra and colleagues (2016), people with ID enjoyed travelling and defined it as a factor that supported their participation in physical activity. Another environmental factor that was frequently reported as a barrier (n=8) was the lack of community support (e.g., discontinued classes, lack of acceptance and awareness, high turnover among staff). This relates to the lack of clear policy guidelines in local service agencies (Dixon-Ibarra et al., 2016; Messent et al., 1999; Messent et al., 1998; Temple & Walkley, 2007). The presence of good support, a warm working climate, and encouragement for physical activity within the organization were reported as facilitators (Aherne & Coughlan, 2016; Sundblom et al., 2015), as was the existence of policy guidelines concerning physical activity (Temple & Walkley, 2007). Further environmental barriers included weather constraints (e.g., winter months, cold weather, or rain), staff expertise (e.g., staff having difficulty thinking of activities), negative societal influences (e.g., discrimination, negative attitudes, and behaviors on the part of others), lack of inclusion (e.g., segregated leisure facilities), and work routines (e.g., other priorities, resistance to change in routines). Finally, family support and geographical location were described as both impeding and facilitating physical activity in people with ID.

** Insert Tables 2 and 3 about here**

3.4. Differences according to level of intellectual disability

The level of ID was reported in 14 (58%) of the 24 studies reviewed. Of these studies, 13 concerned people with mild or moderate ID. Only one of these studies also aimed to identify

barriers for people with severe ID (Hawkins & Look, 2006), and another study aimed to investigate the feasibility of an activity program for people with severe and profound ID (Aherne & Coughlan, 2016). Some (*n*=6) of the studies noted that the level of ID plays a crucial role with regard to participation in physical activity. Greater severity of ID and the related need for supervision were described as limiting physical activity (Aherne & Coughlan, 2016; Dixon-Ibarra et al., 2016; Downs et al., 2013; Mahy et al., 2010; Temple & Stanish, 2011; van Schijndel-Speet et al., 2014). According to Sundblom and colleagues (2015), level of ID is a determinant of the extent to which an intervention could be delivered, as well as the manner in which it could be delivered.

** Insert Table 4 about here**

3.5. Differences among stakeholders

With regard to personal factors, all stakeholders agreed on the facilitating role of social interaction. Others factors were expressed in different ways or not mentioned by all stakeholders. For example, all stakeholder groups reported being rewarded as facilitating, with the exception of the indirect support professionals. People with ID mentioned physical comfort/discomfort only as a limiting factor. The perceptions of stakeholders varied according to physical and intellectual ability (or disability), age, behavioral challenges, actual behavior, behavioral skills, motivation, preferences, and routine. For example, parents mentioned the motivation of people with ID only as a full barrier (Menear, 2007; Temple & Walkley, 2007), while other groups also reported motivation and good understanding of the benefits of physical activity as a possible facilitating factor. In addition, the perceptions of people with ID concerning their characteristics differed from those of other stakeholders. People with ID reported that physical disabilities and aging (e.g., physical symptoms and restrictions related to age) limited their physical activity (Caton et al., 2012; Dixon-Ibarra et al. 2016; van Schijndel-Speet et al., 2014), while other groups also indicated that physical and intellectual abilities could contribute to increased levels of physical activity (Sundblom et al., 2015; Barr & Shields, 2011; Downs et al. 2014).

With regard to environmental factors, all stakeholders highlighted the facilitating role of activities incorporating an element of fun. In addition, all of the stakeholder groups agreed on the impeding role of limited financial support, staffing constraints, and poor weather conditions (e.g., cold, rain, winter weather). Other factors were expressed in different ways or not mentioned by all stakeholder groups. For example, the facilitating role of an external team was reported only by direct and indirect support professionals (Sundblom et al., 2015). The perceptions of stakeholders varied with regard to staff interest, staff expertise, policy guidelines, societal influences, and family support. Most studies report that other stakeholders perceive the staff support as facilitating, while people with ID tend to mention the impeding effects of a lack of support or negative support from staff (Temple & Walkley, 2007; Dixon-Ibarra et al., 2016; van Schijndel-Speet et al., 2014; Frey et al., 2005). Parents and support professionals (both direct and indirect) mentioned staff expertise (or the lack thereof), with parents being most likely to identify this as a barrier. The studies included in this review also reveal differences with regard to policy guidelines. While indirect support professionals spoke positively about policy guidelines for physical activity, direct support professionals and

people with ID emphasized unclear policy guidelines (Messent et al., 1998, 1999; Temple & Walkley, 2007). The perceptions of the various stakeholder groups also differed with regard to the influences of society. People with ID and parents described negative influences, while support professionals (both direct and indirect) also mentioned positive influences. Finally, the perceptions of the stakeholder groups differed with regard to family support. Direct support professionals were more likely than the other stakeholders were to report negative family influences (Downs et al., 2014; Dixon-Ibarra et al., 2016; Messent et al., 2000).

4. Discussion

This systematic review of a sample of 24 studies identifies 37 factors that impede or facilitate physical activity participation in people with ID. The quality ratings of the studies varied, particularly for the qualitative studies. The results indicate that full or partial barriers are reported more frequently than facilitators are. The most frequently reported barriers were related to health issues, motivation and preferences, financial support, staffing levels, and transportation. Social interaction, being rewarded, and activities with an element of fun were repeatedly cited as factors that facilitate physical activity for people with ID. Because very few (only 8%) of the studies included people with severe to profound ID, no comparisons could be made according to level of ID. The results nevertheless indicate that lower intellectual capacity is perceived as a limiting factor. Discrepancies between stakeholders were particularly notable with regard to the routines of people with ID, staff interest, policy guidelines, staff expertise, and societal influences. Interestingly, stakeholders were more inclined to speak negatively about factors that were either the responsibility of or related to others. For example, despite their crucial role in the activation of people with ID, very few direct support professionals described their own internal characteristics as limiting participation in physical activity.

One strength of this review is its thorough survey of the literature from three different perspectives, with a focus on factors, level of ID, and stakeholders. This generated a synthesis of existing knowledge and identified two major research gaps. First, few studies have been conducted on people with severe or profound ID. Of the 24 studies included in this review, only two included people with severe or profound ID (Aherne & Coughlan, 2016; Hawkins & Look, 2006). Moreover, these two studies were of the lowest quality (scoring 2 and 5 points out of a possible 14). In our opinion, research within this sub-population deserves additional attention, as the problem of physical inactivity is known to increase with the severity of ID (Dairo et al., 2016; Stancliffe & Anderson, 2017), particularly in combination with additional motor impairments (Stancliffe & Anderson, 2017; Van der Putten et al., 2017). Furthermore, inactivity can have extensive effects for people with a combination of profound intellectual and severe motor disabilities, and these effects are negatively related to nearly all domains of human functioning (Van der Putten et al., 2017).

It is interesting to note that the majority of the impeding and facilitating factors that were identified refer to the person with ID (i.e., what makes it more difficult or easier for this person to be physically active), with hardly any attention being paid to factors experienced by individuals who are charged with supporting and activating the target group. The supporting role of direct support professionals appears to be particularly overshadowed in the studies included in this review. In addition to addressing the perceptions of direct support

professionals with regard to barriers to and facilitators of physical activity in people with ID, studies could be expected to address the experiences of these professionals in activating people with ID. These two gaps in the existing literature appear to be related, as physical activity in people with more severe ID requires additional effort from others (e.g., parents or direct support professionals), and the supporting roles of these stakeholders increase in importance along with the severity of ID (Buntinx & Schalock, 2010).

Future research should focus on identifying barriers to and facilitators of physical activity. Exploring specific barriers and facilitators perceived by direct support professionals could be a first step for future studies. Qualitative studies including focus groups or interviews would be best suited to the initial exploration of the experiences of direct support professionals in the physical-activity support offered to people with ID. We further recommend exploring the existence and nature of differences in the experiences of professionals directly involved in supporting people with mild, moderate, severe, and profound ID. Such research would also address the knowledge gap concerning people with severe to profound ID, as they are more dependent on such support than are those with less severe ID (Nakken & Vlaskamp, 2007). Studies addressing the level of ID could be of great value in the adaptation of physical activity programs intended for people with ID in general.

In our opinion, the exploration of barriers and facilitators is not sufficient. In order to identify specific issues related to the development, implementation, and maintenance of approaches to physical activity, further research should also include quantitative measures of the extent to which barriers and facilitators are related to several personal and environmental variables. It is therefore necessary to continue the development of existing questionnaires focusing on the perceptions of people with ID, as used in four of the studies included in this review (Heller, Hsieh, & Rimmer, 2003; Melville et al., 2009; Temple, 2007; Temple & Stanish, 2011). There is a strong need to develop a reliable, valid instrument for identifying and measuring barriers and facilitators perceived by other stakeholders (e.g., direct support professionals) who are mainly responsible for including physical activity in their daily work routines in residential facilities. There is no guarantee, however, that eliminating barriers and strengthening facilitators will directly increase levels of physical activity. It would therefore be interesting to examine relationships between barriers or facilitators and the actual level of physical activity in people with ID, or the effectiveness of approaches including strategies (e.g., that strengthen facilitators).

The results of this review suggest several recommendations that could facilitate physical activity in people with ID. First, priority should be given to cooperation and shared responsibility for all parties involved. Second, any approach to making meaningful change in the habits of all parties involved should be supported by a theoretical framework concerning behavior and behavioral change. For example, the Theoretical Domains Framework provides a valid method that can be used to inform intervention design (Cane, O'Connor, & Michie, 2012). Finally, to overcome the most prominent barriers to physical activity in people with ID (e.g., health issues, lack of motivation, and other preferences), it is important to start by reducing or eliminating the environmental barriers. Promising initiatives for people with mild to moderate ID include the projects initiated by the Special Olympics (Marks, Sisirak, Heller, & Wagner, 2010). These projects are intended to eliminate the main environmental barriers identified in our review by providing various options for physical activity and for financial

and community support. Another important component of each project is the opportunity to interact socially with peers. A preliminary evaluation study reported an improvement in perceived health and a more positive attitude toward physical activity in the participants (Marks et al., 2010).

Like all reviews, this review has several limitations. The distribution of factors reported as barriers or facilitators might be skewed, as more papers presented barriers. Weaker barriers (factors reported almost equally often as barriers and facilitators) should therefore be interpreted with caution. Furthermore, barriers or facilitators reported by a small number of studies might apply only to a specific setting or population (e.g. children, adolescents or adults). Finally, some manuscripts were unclear about which informant had indicated a specific barrier or facilitator. In those cases, we chose to classify the barrier or facilitator in all stakeholder groups. This might have affected the comparative analysis of the different stakeholder groups.

5. Conclusion

This review provides insight into factors that impede or facilitate physical activity in people with ID. The results indicate the existence of both personal and environmental barriers to and facilitators of physical activity. Another finding is that very few studies have explored this topic in people with more severe ID. One initial step for future research could be to focus on exploring specific barriers and facilitators experienced by direct support professionals. This would help to fill the knowledge gap concerning people with more severe ID. The results of this review could be useful to researchers and practitioners in the development, implementation, and maintenance of approaches to physical activity in the daily support provided to people with ID.

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Conflict of interest

The authors have no conflict of interest.

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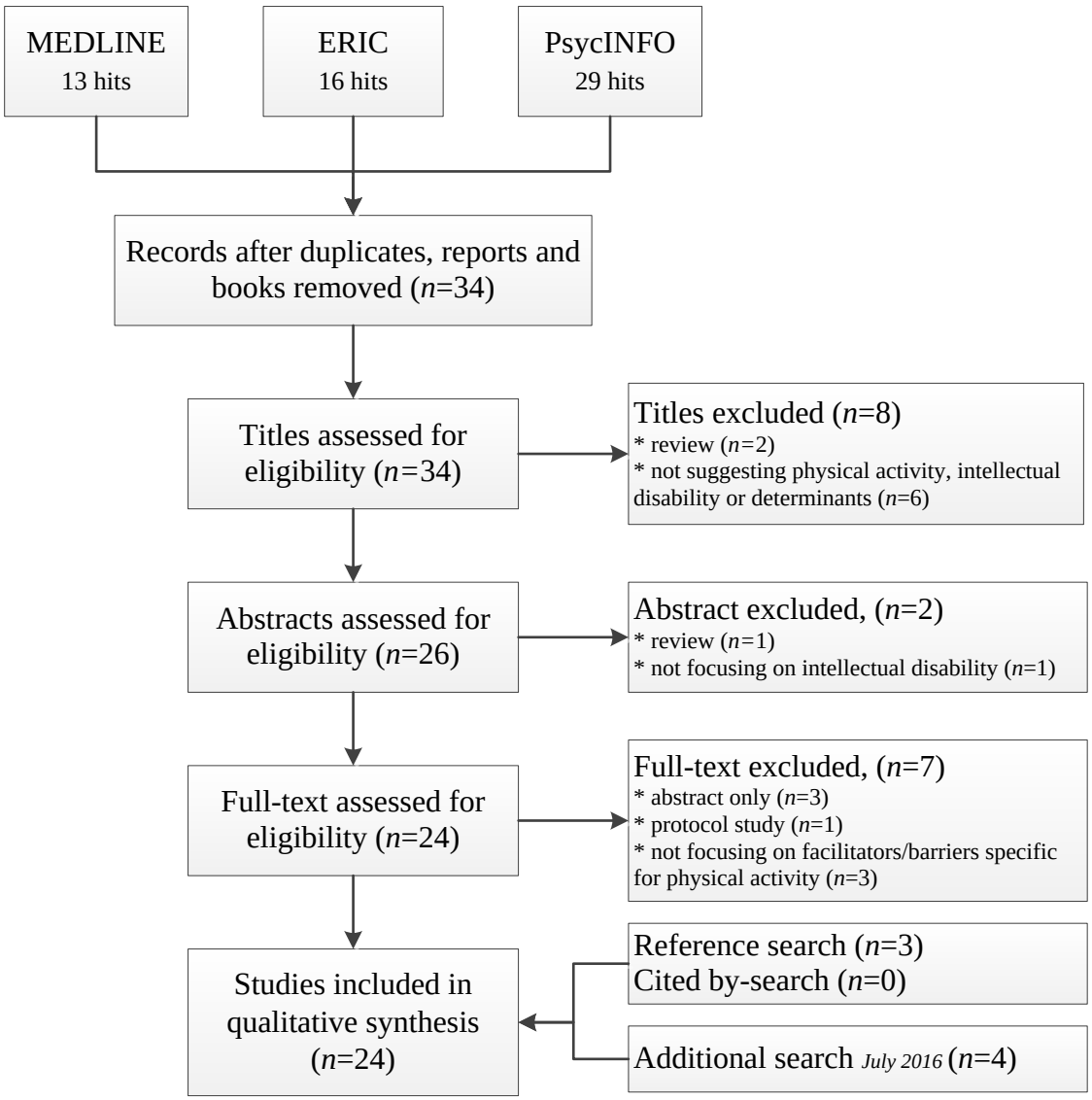

Figure 1. Flowchart of the literature search

Table 1
Overview of studies included

	Study	Aim(s)	Sample		Study design	Quality assessment
			1) Population (age range) 2) ID level 3) Informant (*n*)	4) Setting 5) Country	1) Type of data 2) Data collection 3) Data analyses	
1.	Aherne & Coughlan (2016)	To investigate the suitability of an aquatics program for service users with severe and profound ID	1) ID (39–57 year) 2) Severe to profound 3) Key workers (*n*=3), household manager (*n*=1), pool coordinator (*n*=1), manager of the service (*n*=1)	4) Residential service 5) Ireland	1) Qualitative 2) Semi-structured interviews 3) Thematic analysis	5/14
2.	Alesi & Pepi (2015)	To explore parental beliefs concerning involvement in, barriers to/facilitators of, and benefits of PA in young people with DS	1) DS (7–27 year) 2) Moderate 3) Parents (*n*=13; 7 mothers, 6 fathers)	4) Home 5) Italy	1) Qualitative 2) Semi-structured interviews 3) Thematic analysis	10/14
3.	Barr & Shields (2011)	To explore barriers to and facilitators of PA for children with DS	1) DS (2–17 year) 2) NR 3) Parents (*n*=20; 16 mothers, 4 fathers)	4) Home 5) Australia	1) Qualitative 2) In-depth interviews 3) Thematic analysis	11/14
4.	Brooker et al. (2015)	To enhance understanding of the views of potential participants, both people with ID and volunteers, to inform a walking and social-support program	1) ID (30–59 year) 2) Mild 3) People with ID (*n*=5), volunteers (*n*=6)	4) Supported work site 5) Australia	1) Qualitative 2) Semi-structured interviews 3) Thematic analysis	9/14

	Study	Aim(s)	Sample		Study design	Quality assessment
			1) Population (age range) 2) ID level 3) Informant (*n*)	4) Setting 5) Country	1) Type of data 2) Data collection 3) Data analyses	
5.	Caton et al. (2012)	To provide insight into how people with ID understand health and healthy lifestyle choices and to identify barriers to and facilitators of health	1) ID (27–72 year) 2) NR 3) People with ID (*n*=13)	4) Family (*n*=4), staff-supported accommodation (*n*=8), alone with some staff support (*n*=2) 5) United Kingdom	1) Qualitative 2) Semi-structured interviews 3) Thematic analysis	10/14
6.	Dixon-Ibarra et al. (2016)	To conduct a qualitative exploration of PA in the group-home setting and to identify what key stakeholders want from a PA program	1) ID (26–65 year) 2) Mild to moderate 3) People with ID (*n*=6), support staff (*n*=8), program coordinators (*n*=6)	4) 24-h group-home agencies (*n*=3) 5) USA	1) Qualitative 2) Semi-structured focus groups 3) Thematic analysis	11/14
7.	Downs et al. (2013)	To explore PA in children and young people with Down syndrome from birth, specifically exploring the opportunities available to young people with Down syndrome and perceived barriers to PA	1) DS (6–21 year) 2) NR 3) Families (*n*=8)	4) Home 5) United Kingdom	1) Qualitative 2) Dyadic interviews 3) Thematic analysis using the YPAP Model	10/14
8.	Downs et al. (2014)	To explore teachers' perceptions of barriers to and facilitators of PA, including enabling, reinforcing, and predisposing factors among children and youth with ID	1) DS (4–18 year) 2) NR 3) Teachers and teaching assistants (*n*=23)	4) Special educational needs schools 5) United Kingdom	1) Qualitative 2) Focus groups 3) Thematic analysis using the YPAP Model	11/14

	Study	Aim(s)	Sample		Study design	Quality assessment
			1) Population (age range) 2) ID level 3) Informant (*n*)	4) Setting 5) Country	1) Type of data 2) Data collection 3) Data analyses	
9.	Frey et al. (2005)	To examine perceptions of PA behavior in adults with mental retardation, focusing on the perceptions of participants rather than those of care providers	1) ID (23–45 year) 2) Mild 3) Adults with ID (*n*=12), parents (*n*=4), job supervisors (*n*=2)	4) With parents (*n*=4); independent (*n*=8) 5) USA	1) Qualitative 2) In-depth interviews 3) Inductively according to an interpretative process	10/14
10.	Hawkins & Look (2006)	To identify levels of PA in a population of adults with learning disabilities and to identify barriers to physical exercise, as perceived by residential and day service staff	1) ID (22–55 year) 2) Mild to severe 3) Staff (*n*=19)	4) Group homes 5) United Kingdom	1) Qualitative 2) Semi-structured interviews 3) NR	2/14
11.	Heller et al. (2003)	To examine the impact of barriers to exercise and attitudes of carers concerning exercise outcomes on the exercise participation of adults with Down syndrome (DS).	1) DS (30–57 year) 2) Mild to moderate 3) Adults with DS (*n*=44), primary care giver (staff or relative; *n*=44)	4) With family (52%); independent (5%); supervised residences (43%) 5) USA	1) Quantitative 2) The Exercise Barriers Scale (Heller et al., 2001) 3) Descriptive statistics, paired-sample t-test, multiple regression analysis	8/13
12.	Mahy et al. (2010)	To identify barriers to and facilitators of PA from the perspectives of adults with Down syndrome and their support people	1) DS (21–44 year) 2) NR 3) Adults with DS (*n*=6), support people (mother (*n*=4) or staff (*n*=8))	4) Home (*n*=5). Share supported accommodation (*n*=1) 5) Australia	1) Qualitative 2) Semi-structured interviews 3) Thematic analysis	9/14

	Study	Aim(s)	Sample		Study design	Quality assessment
			1) Population (age range) 2) ID level 3) Informant (*n*)	4) Setting 5) Country	1) Type of data 2) Data collection 3) Data analyses	
13.	Melville et al. (2009)	To examine the training needs of carers in the areas of diet and PA	1) ID (≥18 year) 2) NR 3) Carers (*n*=63)	4) Community 5) United Kingdom	1) Quantitative 2) Questionnaire; a list of eight barriers based on previous research; developed by the researchers 3) Descriptive statistics, weighted scores	8/13
14.	Menear (2007)	To investigate parents' perceptions of the health and PA needs of their children with Down syndrome	1) DS (3–14 year) 2) NR 3) Parents (*n*=21)	4) Home 5) USA	1) Qualitative 2) Focus groups 3) Thematic (comparison) analysis	9/14
15.	Messent et al. (1998)	To evaluate cardio-respiratory fitness, obesity levels, daily PA levels, and barriers to a physically active lifestyle in a group of 24 adults with mild and moderate learning disabilities	1) ID (24–47 year) 2) Mild to moderate 3) Adults with ID (*n*=24), staff (*n*=12)	4) Residential homes (*n*=3); day center (*n*=1) 5) United Kingdom	1) Qualitative 2) Interviews 3) NR	5/14
16.	Messent et al. (1999)	To establish whether a group of 24 adults with mild and moderate learning disabilities receive adequate support in making choices leading to a physically active lifestyle	1) ID (24–47 year) 2) Mild to moderate 3) Adults with ID (*n*=24), staff (*n*=12)	4) Residential homes (*n*=3); day center (*n*=1) 5) United Kingdom	1) Qualitative 2) In-depth interviews 3) NR	7/14

	Study	Aim(s)	Sample			Study design	Quality assessment
			1) Population (age range) 2) ID level 3) Informant (*n*)	4) Setting 5) Country		1) Type of data 2) Data collection 3) Data analyses	
17.	Messent et al. (2000)	To establish whether adults with mild and moderate learning disabilities receive adequate support in making choices leading to a physically active lifestyle	1) ID (24–47 year) 2) Mild to moderate 3) Adults with ID (*n*=24), staff (*n*=12)	4) Residential homes (*n*=3); day center (*n*=1) 5) United Kingdom		1) Qualitative 2) In-depth interviews 3) NR	7/14
18.	Ptomey et al. (2016)	To enhance understanding of the perspectives of parents concerning strategies for supporting the success of children and adolescents with ID in a weight-management program and barriers to such success, in addition to identifying how this information could be used to guide future approaches	1) ID (11–18 year) 2) NR 3) Parents (*n*=18)	4) Home 5) USA		1) Qualitative 2) Semi-structured interviews 3) Thematic analysis	10/14
19.	Sundblom et al (2015)	To explore aspects important to the implementation of a multi-component health promotion intervention for adults with ID, as perceived by health ambassadors and managers	1) ID (NR) 2) Mild to moderate 3) Health ambassadors (*n*=12), managers (*n*=5)	4) Community, residential homes 5) Sweden		1) Qualitative 2) Semi-structured interviews 3) Content analysis	10/14
20.	Van Schijndel-Speet et al. (2014)	To explore the preferences of older adults with ID for specific physical activities, as well as barriers to and facilitators of PA	1) ID (50–80 year) 2) Mild (*n*=28) to moderate 3) Adults with ID (*n*=40)	4) Day-activity centers (*n*=7) of three care provider services for people with ID 5) The Netherlands		1) Qualitative 2) In-depth interviews (*n*=14) and focus groups (*n*=4) 3) Open coding, clustered in coding frames (based on an existing theory)	12/14

	Study	Aim(s)	Sample		Study design	Quality assessment
			1) Population (age range) 2) ID level 3) Informant (*n*)	4) Setting 5) Country	1) Type of data 2) Data collection 3) Data analyses	
21.	Temple (2007)	To examine associations between participation in PA/sedentary behavior and factors consistent with behavioral choice theory: enjoyment, preference, and barriers	1) ID (18–52 year) 2) NR 3) Adults with ID (*n*=37)	4) NR 5) Canada	1) Quantitative 2) Mail survey; questionnaire on PA and health 3) Descriptive statistics, linear regression analysis	10/13
22.	Temple & Stanish (2011)	To examine the feasibility of using a peer-guided model to foster the participation of young people with ID in community-based exercise	1) ID (15–21 year) 2) Mild 3) Youth with ID (*n*=20), parents (*n*=NR), work-out buddies (*n*=14)	4) Community 5) NR	1) Quantitative 2) Interview; questionnaire on enjoyment, barriers, and preferences 3) Descriptive statistics, paired t-tests	11/13
23.	Temple & Walkley (2007)	To explore factors perceived as enabling or inhibiting participation in PA by adults with ID from a health-promotion perspective	1) ID (18–41 year) 2) NR 3) Adults with ID (1 group, *n*=9), direct support professionals (1 group, *n*=5), group home supervisors (2 groups, *n*=9; *n*=6), managers (1 group, *n*=4), parents (1 group, *n*=7)	4) NR 5) Australia	1) Qualitative 2) Focus groups 3) Open coding of predisposing, enabling, and reinforcing factors	8/14

	Study	Aim(s)	Sample		Study design	Quality assessment
			1) Population (age range) 2) ID level 3) Informant (*n*)	4) Setting 5) Country	1) Type of data 2) Data collection 3) Data analyses	
24.	Tsai and Fung (2009)	To examine the experiences of parents of people with ID as they sought inclusive sport participation for their children	1) ID (12–50 year) 2) Mild to moderate 3) Parents (*n*=49)	4) Home 5) China	1) Qualitative 2) Semi-structured in-depth interviews 3) Open, axial, and selective coding using the constant comparison process	8/14

Note. NR = not reported; ID = intellectual disability; DS = Down syndrome; PA = physical activity.

Table 2

Personal barriers to and facilitators of physical activity

Full barriers	◄	Neutral	►	Full facilitators
Fear (4/0)	Health issues (11/6)	Routine (2/2)		Social interaction (0/12)
Financial resources (3/0)	Motivation (8/3)			Being rewarded (0/6)
	Preferences (8/3)			
	Intellectual ability/disability (6/2)			
	Physical abilities/disabilities (6/3)			
	Age person with ID(4/1)			
	Physical comfort/discomfort (3/2)			
	Challenging behavior (3/2)			
	Behavioral skills (3/2)			

Note. Numbers in parentheses indicate the number of studies reporting the factor as a barrier and the number of studies reporting the factor as a facilitator.

Table 3

Environmental barriers to and facilitators of physical activity

Full barriers	◄	Neutral	►	Full facilitators
Lack of financial support (12/0)	Staffing level (13/1)	Adapted and accessible activities, or lack thereof (6/6)	Staff interest (positive support) (8/9)	Activity with fun component (0/7)
Limited options for physical activity (4/0)	Transport (9/2)		Regular nature of physical activity (3/4)	One-to-one nature (0/1)
Anxiety on the part of staff and parents(4/0)	Weather/season (7/1)			External research team (0/1)
Time constraints parents (2/0)	Community support (8/2)			Having a pet (0/1)
Competitive component (1/0)	Staff expertise (6/2)			
	Societal influences (6/3)			
	Policy guidelines (5/2)			
	Lack of inclusion (3/1)			
	Family support (8/7)			
	Geographical location and environment (5/4)			
	Work routines (2/1)			

Note. Numbers in parentheses indicate the number of studies reporting the factor as a barrier and the number of studies reporting the factor as a facilitator.

Table 4

Summary of results by stakeholders

	People with ID (*n* = 13)*	Parents (*n* = 11)	Direct support professionals (*n* = 15)	Indirect support professionals (*n* = 4)
Personal				
Health issues	-	-	-	- -
Physical abilities/disabilities	- -	-	-	+/-
Physical comfort/discomfort	-			
Intellectual abilities/disabilities	- -	+/-	-	-
Age	- -	+/-	-	
Fear person with ID	- -		- -	
Challenging behavior	++	++	-	-
Behavioral skills		-	++	++
Motivation, or lack thereof	-	- -	-	+
Preferences	-	-	-	+/-
Being rewarded	++	++	++	
Social interaction	++	++	++	++
Routine	++	++	+/-	- -
Financial resources	- -		- -	
Environmental				
Options for physical activity	- -		- -	- -
Adapted and accessible activity, or lack thereof	- -	+	++	++
Regularity, or lack thereof	-	+/-	++	++
Inclusive activities, or lack thereof		-	- -	
Competitive component		-		
Activity with fun component	++	++	++	++
Staffing levels	- -	- -	-	-
Time constraints – parents		- -		
Financial support, or lack thereof	- -	- -	- -	- -
Policy guidelines	- -		-	+
Staff interest	-	+	+	+
Anxiety on the part of staff			- -	- -
Anxiety on the part of parents		- -		
Family support	+/-	+/-	-	++
Community support	- -	- -	-	-
External research team			++	++
Staff expertise		-	-	+/-
Work routines			+/-	-
Societal influences	- -	- -	+	++
Weather/season	- -	- -	-	- -
Geographical location and environment	-		+/-	
Transport	-	-	- -	
Having a pet			++	

Note * *n* number of studies; - -full barrier; - barrier; +/- neutral; + facilitators; ++ full facilitators.